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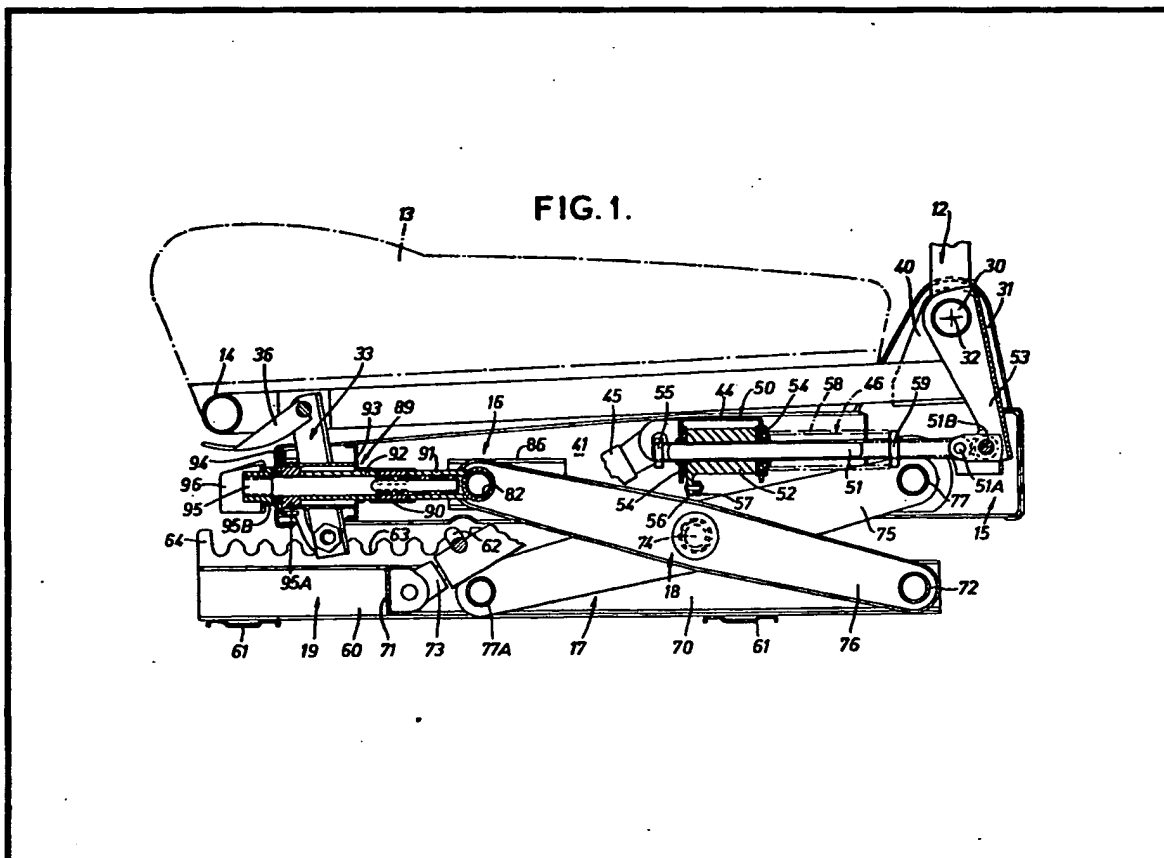
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ber. Each locking means 50, 89 is
biased towards the locking position.

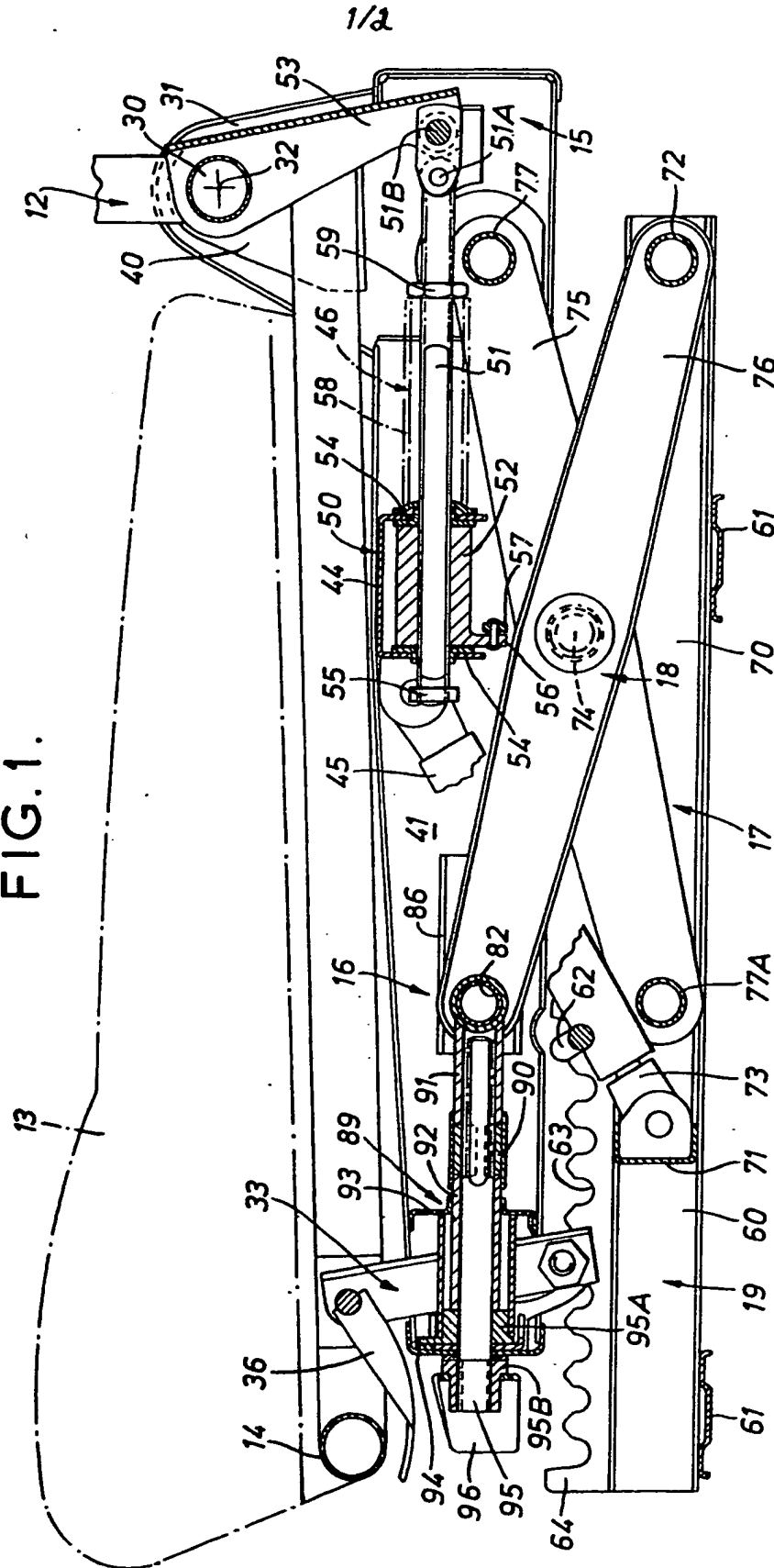
(54) Seat locking means

(57) A vehicle seat assembly having quickly releasable locking means to permit adjustment of the attitude of parts of the assembly. The two locking means shown 50, 89 each include a shaft 51, 90 and a collar or outer member 52, 95 which have interrupted threads (or arcuate teeth), and are relatively arcuately movable between a locking position in which the threads engage and a released position in which the threads are disengaged to permit longitudinal movement of the shaft relative to the collar or outer mem-



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FIG. 1.



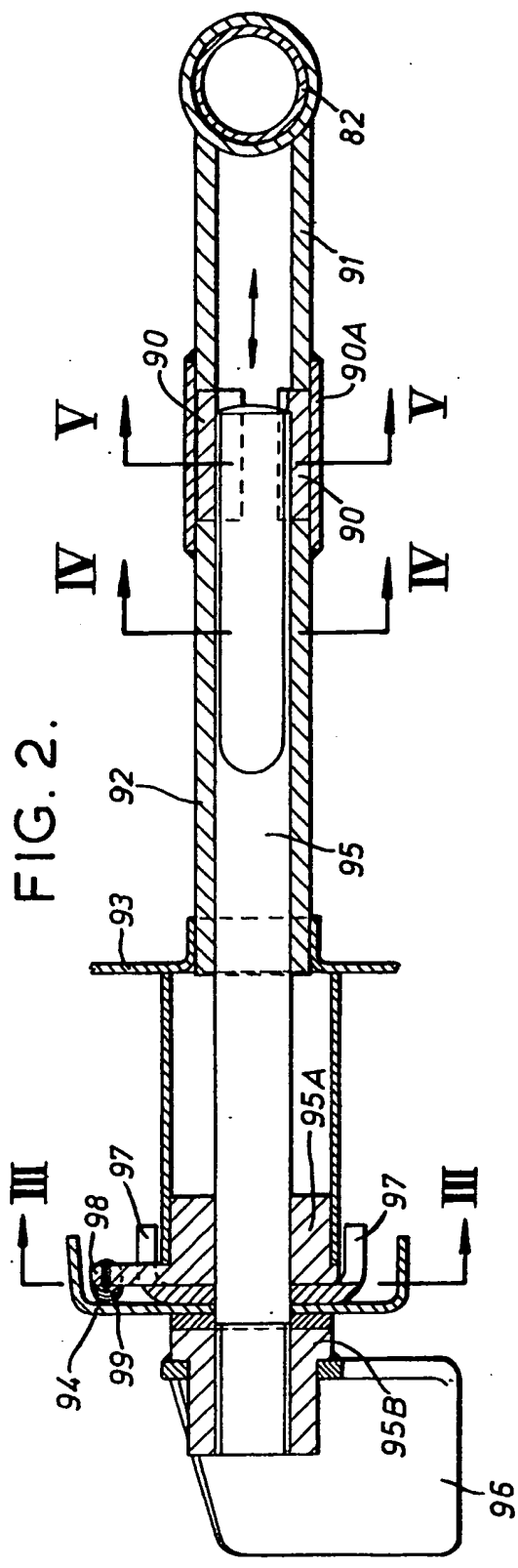


FIG. 2.

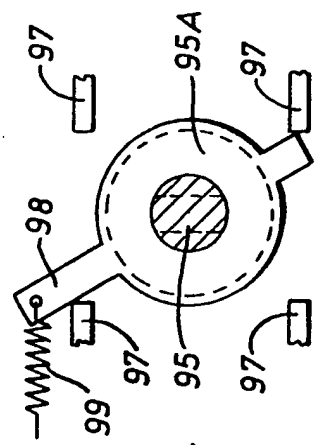


FIG. 3.

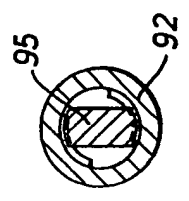


FIG. 4.

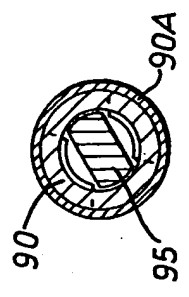


FIG. 5.

SPECIFICATION

Improvements relating to seat assemblies, for vehicles

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This invention concerns seat assemblies for vehicles.

There are known a vast number of different forms of mechanisms for permitting adjustments to be made to the attitudes of vehicle seat assemblies, many of which have faults and disadvantages which are not immediately apparent but which cause inconvenience to the user of the seat.

15 An object of the present invention is to provide a vehicle seat assembly incorporating locking means which is releasable to permit adjustment of the attitude of part of the seat assembly, and which can be constructed so as to be strong, reliable and easy to operate.

According to the present invention there is provided a vehicle seat assembly comprising a first portion which is movable relative to a second portion to vary the attitude of part of the seat assembly, and locking means to prevent movement of said first portion relative to the second portion; wherein the locking means comprises a shaft connected to one of said portions, and a collar or outer member connected to the other of said portions and located around said shaft; wherein the connections between the locking means and said portions are arranged so that a movement of the first portion relative to the second portion causes relative movement longitudinally of the shaft between the shaft and the collar or outer member; and wherein the shaft and collar or outer member are each provided with arcuate teeth or a longitudinally interrupted thread, and are arranged so as to be relatively arcuately movable between a locking position, in which the teeth or threads engage to prevent relative longitudinal movement between the shaft and the collar or outer member, and a released position in which the teeth or threads are disengaged to permit said relative longitudinal movement and thereby the movement of the first portion.

10 Biasing means is preferably provided to urge the locking means into the locking position. The biasing means may comprise a spring which is assisted by a weight movable about the axis of the shaft, and, in those embodiments employing interrupted threads, the direction of the threads is preferably such that any tongue, produced by the threads as a result of the normal working loads applied to the seat, tends to urge the locking means into the locking position.

60 The relative arcuate movement of the shaft and the collar may be restricted to 90° or less, preferably to about 60°.

The locking means is preferably connected to said first and second portions so the shaft is only movable arcuately relative to said first

portion and the collar or outer member is constrained to move bodily with a part of the second portion, which part may be movable about an axis perpendicular to the shaft axis to permit self alignment of the collar or outer member with the axis of the shaft.

70 In one embodiment, the second portion is an upper frame of a support assembly, which upper frame carries a seat of the seat assembly, the support assembly serving as the first portion and being adapted to adjust the height of the upper frame relative to a base portion of the seat assembly.

The invention will be described further, by way of example, with reference to the accompanying diagrammatic drawings, wherein:—

Figure 1 shows in partial vertical cross-section, lower portions of a seat assembly of the invention, and, in broken outline a seat cushion of the assembly;

Figure 2 shows an enlarged vertical cross-section of locking means incorporated into the seat assembly;

Figures 3, 4 and 5 show transverse cross-sections through parts of the locking means and correspond to the section lines III—III, IV—IV and V—V shown in Fig. 2.

The seat assembly generally comprises a backrest having a frame 12, a seat 13 having a seat frame 14, a support assembly 15, and a base frame 19.

The support assembly 15 includes an upper frame 16, a lower frame 17 and a rise and fall mechanism 18 connecting said frames 16 and 17; and is provided with locking means as hereinafter described.

The backrest frame 12 is provided at its lower end with a transverse bottom-tube 30, each end of which tube 30 is pivotally connected by a pivot arrangement to a respective one of two extensions 31 which project upwards at the rear end of the upper frame 16 from the sides of the latter, so that the backrest can be swung backwards and forwards relative to the seat 13 and support assembly 15 about a rake axis 32 to vary only the rake angle of the backrest.

The front end portion of the seat frame 14 is connected to and supported by the upper frame 16 by means of a tilt adjustment mechanism 33, which mechanism is actuable by a lever 36 to allow the front end portion of the seat frame to be raised and lowered relative to the upper frame 16.

120 The seat frame 14 is provided with a pair of extensions 40 which project upwards from locations on the sides of the seat frame disposed at the rear of the seat frame.

The upper frame 16 comprises a pair of side members 41 each of which has one extension 31 secured thereto so as to project upwards from the sides at the rear end of the frame 16, and the side members 41 and extensions 31 serve as mountings to support the pivot arrangements, on which the exten-

sions 40 are supported so that the seat can be tilted about a tilt axis co-incident with the rake axis 32 when the front of the seat is raised and lowered.

5 The upper frame includes a main cross member 44 which serves as a mounting for rake locking means 50 (hereinafter described) and as a reaction member for a seat height bias 45 and a rake bias 46.

10 The lower frame 17 comprises a pair of side members 70 joined by a fixed front cross member 71, and a captive rotatable rear tubular cross member 72. A lower end 73 of the seat height bias 45 is pivotally secured to the front cross member 71.

15 The rise and fall mechanism 18 comprises a pair of parallel lazy tongues devices interconnected so as to have a common travelling axis. Each said device comprises first and

20 second two armed levers 75 and 76 centrally connected by a pivot 74, which pivots are aligned on the travelling axis. The first lever 75 has an upper end secured pivotally to a rear end of one side member 41 by a tubular cross member 77, and has a lower end carried by a further tubular cross member 77A carried by a front carrier shaft (not shown).

25 The second lever has its lower end secured to the rear tubular cross member 72 so as to be supported, together with the side member 70, on a bush on a rear carrier shaft (not shown) co-axially disposed in said cross member 72; and has its upper end supported on a hollow travelling shaft 82 which links said upper

30 ends of the second levers. The travelling shaft 82 has terminal slides which run in horizontal ways defined by inwardly directed flanges 86 on the side members 41 of the upper frame 16 so as to be movable backwards and forwards relative to the upper frame 16.

40 The front carrier shaft is located slidably by means of the bushes which extend through elongate horizontal ways provided in the side members 70 of the lower frame and by

45 means on slides which engage flanges on the members 70.

The rise and fall mechanism 18 is movable between a collapsed position in which the seat is in its lowest position (as shown), and an

50 extended position in which the seat is in its highest position, and can be held in these positions or substantially in any position therebetween by means of a height locking means 89. The locking means 89 (shown in more

55 detail in Figs. 2 to 5) includes the travelling shaft 82; an outer member 90A carrying two parts 90 which provide an interrupted internal thread, which outer member is rigidly supported on a mounting 91 which projects forwards from and is pivotally carried by the

60 shaft 82; a sleeve 92 which extends towards a two part front cross member 93, 94 of the upper frame; and a locking shaft 95 having an external interrupted threaded which extends through the outer member 90A through

the sleeve 92 and thrust bearings 95A, B to a handle 96. The handle 96, shaft 95 and bearings 95A, B are secured together so as to be arcuately movable, and so as to embrace

70 the cross member 94 so that any longitudinal movement of the shaft 95 is extremely restricted. The interruption of the threads is such that in a locking position they engage to prevent movement of the shaft 82, and can be disengaged by turning the shaft 95 against the action of locking bias means through

75 about 60° from the locking position to a released position, to permit the outer member to be moved along the shaft by the mounting

80 91, and thereby permit the shaft 82 to be moved backwards or forwards relative to the cross member 93, 94, whereby to vary the effective length and height of the lazy tongues devices. As shown in Figs. 2 and 3, the part

85 94 of the cross member incorporates a plurality of stops 97 which limit the movement of lugs 98 on the bearing 95B and thereby the movement of the shaft 95 to about 60°. The locking bias means comprises a spring 99

90 connecting one lug 98 with the part 94 to urge the shaft 95 to the locking position. The weight of the handle 96 also urges the shaft 95 towards the locking position.

The seat height bias 45 counterbalances the

95 weight of the seat and produces a small bias tending to shorten and heighten the lazy tongues devices.

The rake locking means 50 is similar to the locking means 89 in that it comprises a shaft

100 51 having an external interrupted thread, a collar 52 having an internal interrupted thread, and bias means to urge the locking means into a locking position in which the threads engage to prevent relative axial movement of the shaft 51 and collar 52. The shaft

105 51 is secured at one end by pivots 51A and B to a lever 53 which is secured to the tube 30, and the shaft extends forwards through bushes 54 mounted on the cross member 44.

110 A stop nut 55 is provided at the other end of the shaft. The collar 52 is located around the shaft between the bushes 54 so as to be prevented from moving longitudinally of the shaft relative to the cross member 44. The

115 collar 52 has an extension 56 connected at its outer end by a pivot to an actuating member 57 which is movable manually transversely of the upper frame 16 to move the collar arcuately from the locking position to the released position. The bias means comprises a spring

120 (not shown) connected between the actuating 57 and the upper frame 16.

When the rake locking means is in the released position, the backrest can be moved

125 under or against the rake bias 46 to move the shaft 51 longitudinally. The rake bias 46 comprises a spring 58 located around the shaft 51 between a nut 59 on the shaft and the cross member 44 to urge the backrest

130 forwards.

The base frame 19 comprises side members 60 secured to cross members 61 adapted to be secured to a vehicle. The side members are of inwards facing channel form and provide horizontal ways for terminal rollers on the front and rear carrier shafts, so that the whole of the seat assembly except for the base frame 19 can be moved linearly forwards and backwards relative to the base frame when a base locking device of the locking means is released.

The base locking device comprises a transverse member 62 supported on two arms which are pivotally mounted on the lower frame 17. The base frame is provided with two rows of upwardly open sockets 63, each socket being shaped to receive an end portion of the member 62. A manually operable mechanism is provided to lift the member 62 against a return bias out of the sockets to allow the lower frame to move relative to the base frame between limits set by stops 64.

In the rake and height locking means, the screw threads are arranged so that a backwards load on the backrest and downwards load on the seat tend to urge the locking means to the locking position, and the pitch of the threads are preferably sufficiently fine to permit adjustment of the seat and backrest positions by small increments.

It will be easily appreciated that the locking means can be constructed inexpensively so as to be robust and easy to operate to allow rapid adjustments to be made.

The invention is not confined to the precise details of the foregoing example, and many variations are possible within the scope of the invention as defined by the appended claims. For instance the outer member 90A may be fixed to the shaft 82 and the shaft 82 may be rotatable about its axis to allow the outer member to move so as to be self aligning with the axis of the shaft 95. The interrupted threads may be replaced by rows of arcuate teeth, the rows extending longitudinally of the shaft and collar or outer member.

CLAIMS

1. A vehicle seat assembly comprising a first portion which is movable relative to a second portion to vary the attitude of part of the seat assembly, and locking means to prevent movement of said first portion relative to the second portion; wherein the locking means comprises a shaft connected to one of said portions, and a collar or outer member connected to the other of said portions and located around said shaft; wherein the connections between the locking means and said portions are arranged so that a movement of the first portion relative to the second portion causes relative movement longitudinally of the shaft between the shaft and the collar or outer member; and wherein the shaft and collar or outer member are each provided with arcuate

teeth or a longitudinally interrupted thread, and are arranged so as to be relatively arcuately movable between a locking position, in which the teeth or threads engage to prevent relative longitudinal movement between the shaft and the collar or outer member, and a released position in which the teeth or threads are disengaged to permit said relative longitudinal movement and thereby the movement of the first portion.

2. An assembly as claimed in claim 1, wherein the arcuate movement of the shaft or collar or outer member is limited to 90° or less.

3. An assembly as claimed in claim 1 or 2, wherein the locking means is connected to said first and second portions so the shaft is only movable arcuately relative to said first portion and the collar or outer member is constrained to move bodily with a part of the second portion.

4. An assembly as claimed in claim 1, 2 or 3, wherein the shaft is rotatably mounted on the second portion, and the collar or outer member is movable longitudinally of the shaft relative to the second portion.

5. An assembly as claimed in claim 4, wherein the second portion is an upper frame of a support assembly, which upper frame carries a seat of the seat assembly, the support assembly serving as the first portion and being adapted to adjust the height of the upper frame relative to a base portion of the seat assembly.

6. An assembly as claimed in claim 1, 2 or 3, wherein the collar or outer member is rotatably mounted on the second portion, and the shaft is movable longitudinally relative to the second portion.

7. An assembly as claimed in claim 6, wherein the second portion is an upper frame on which a seat and a backrest of the assembly are supported, the backrest serving as the first portion and being pivotally mounted so as to be angularly adjustable relative to the upper frame.

8. A vehicle seat assembly comprising locking means substantially as hereinbefore described with reference to Fig. 1 of the accompanying drawings.

9. A vehicle seat assembly substantially as hereinbefore described with reference to the accompanying drawings.

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